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AMMUNITION BULLETIN Nº15.

FOR INSPECTING ORDNANCE OFFICERS.

(DECEMBER 1940).

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CHIEF INSPECTOR OF ARMAMENTS,
WOOLWICH, S.E.18.



AMMUNITION BULLETIN NO. 15.
FOR INSPECTING ORDNANCE OFFICERS.

DECEMBER 1940.

No issue was
made in November.

Issued by:

Chief Inspector of Armaments,
Woolwich.

Contents:

- 157. Cartridge Cases - 4.5 inch A.M.
- 158. Fuzes - Non Lead Free.
- 159. Cordite - Sulphur Infected.
- 160. Fuze Weight Markings.
- 161. Special Marking of Cartridges Q.F. 4.5 inch and Containers containing American 1918. N.C.T. CC5.
- 162. Amendment to Bulletin No.6.
- 163. Damp Igniters.
- 164. Fuze Percussion D.M. No.115.E.
- 165. Marking of Ammunition. 20 m.m. Hispano Gun H.E.

ENEMY AMMUNITION.

- 166. Magnetic Mines used as Bombs.
- 167. Anti-Personal Bombs - New Type.
- 168. Incendiary Bombs - Collapsible Container.
- 169. 1 Kg. German Incendiary Bomb.
- 170. Amendment to Bulletin No.5.
- 171. German Aircraft Bombs - Method of determining whether Bombs dropped from high altitudes have Exploded.
- 172. German Small Arms Ammunition.
- 173. Details of Italian Aircraft, Bombs and Fuzes.
- 174. German Anti-Withdrawal Device. Z.U.S.40.

No.157. CARTRIDGE CASES. 4.5 in. A.A. (Fig.40)

A certain number of 4.5" A.A. Cartridge Cases have been issued which have three holes drilled equidistant to a depth of $\frac{1}{4}$ inch in the base around the primer. These holes were originally intended to take the arms of a safety clip which is not now used. Some doubt has arisen as to whether these holes tend to weaken the case sufficient to make it dangerous, it should be noted, therefore, that these cases are serviceable.

No.158. FUZES - NON LEAD FREE.

Approval has been given for the use of non-lead-free 106E fuzes in shell Q.F. H.E., 18 pr., filled lyddite subject to the following conditions:-

- (a) The shellac and cement R.D.No.1 on base is perfect.
- (b) That luting is used on all external threads of fuzes.
- (c) Rounds must NOT be issued to India and in other cases are considered suitable only for 6 months from the date of fuzeing.

No.159. CORDITE - SULPHUR INFECTED.

Cordite W.M. found to be sulphur infected will be dealt with in accordance with R.A.O.S. Part II, Pamphlet No.7, Para.33 (b). The regulation will be amended in due course to include this nature of cordite.

No.160. FUZE WEIGHT MARKINGS.

Fuze Percussion, D.A.No.117.
Fuze D.A. and Percussion No.119.
Fuze Time No.210.
Fuze Percussion No.231.

The following system of marking to distinguish the difference in weight of the above mentioned fuzes constructed of different metals has been approved:-

Light Fuzes. i.e. fuzes weighing 2-lbs. 2-ozs. and over, but not reaching 2-lbs. 6-ozs. to have a large "L" stencilled.

Very Light Fuzes. i.e. fuzes weighing 1-lb. 14-ozs. and over, but not reaching 2-lbs. 2-ozs. to have the letters "LL" similarly stencilled.

No.161. SPECIAL MARKING OF CARTRIDGES Q.F. 4.5 INCH AND CONTAINERS CONTAINING AMERICAN 1918 N.C.T.065.

It has been decided to apply special marking to the above mentioned cartridges and their containers similar to the marking for cartridges and boxes containing old Cordite (Vide Item 74, Bulletin No.8).

The marking is to be as follows:-

- (a) All containers will be marked with a large red circular disc and the last two numerals of the year will denote date life of N.C.T. expires.
- (b) Cartridges will have the same marking in black (silver nitrate) on the wall of the case.

No.162. AMENDMENT.

Bulletin No.6. Para.52 sub-para (i) after "Explosives" add

"This marking will also be found on shot fitted with tracers".

163.

DAMP IGNITERS.

During the winter period, the gunpowder igniters of B.L. Cordite or N.C.T. cartridges in ready use ammunition at gun positions, are liable to be affected by damp.

The results of damp igniters are failure to fire or hangfire, the latter being somewhat disturbing as, in the dark periods, there is some risk of the breech being opened with a smouldering cartridge when an explosion may occur.

Units should be urged to ensure that igniters are protected against wet or damp.

From the I.O.O.'s point of view, it is useful to know that a gunpowder igniter cannot normally sulphur infect the Cordite charge through the action of the atmosphere; the igniter will usually require to be wetted, i.e. in contact with water, rain etc. before sulphur infection of the cordite occurs. Consequently I.O.O. should discriminate in sentencing, between wet igniters which cause sulphur infection and damp igniters which do not. There is no Service test for indicating when a gunpowder igniter becomes unserviceable through dampness. The moisture test given in R.A.O.S. relates to Gunpowder in Bulk only. It may be assumed however that a moisture content up to 3% will not affect the serviceability. The real test is the practical one of "feel" so that as long as the powder is not caked and the igniter "feels" dry, it can be taken as serviceable. Caking sometimes occurs with dry powder, consequently the igniter should be massaged gently to bring the contents to the powder form.

In the last war, spare igniters were issued to units in the proportion of 5% of the cartridges held, and a similar issue has now been approved for Coast Defence guns, which may, possibly, be extended later to cover other natures. Coast Defence units are expected to replace damp igniters by Serviceable spare igniters under the supervision of the Master Gunner, whilst Field units simply tie the additional dry igniters over the damp igniter and load the lot in the gun. Obviously special care must be exercised to keep these spare igniters, which are issued in special packages, dry and free from damp.

Sulphur infected Cordite according to R.A.O.S. is to be destroyed, on receipt of War Office approval, but it is useful to know that Sulphur infection does not render the cordite unserviceable immediately. In fact, with the carbamite cordites this deterioration is comparatively slow. The Cartridges suitably marked to facilitate identification should be segregated in all cases, but if the supply of fresh cartridges presents difficulties the doubtful cartridges can be retained on unit charge, though segregated, for some time and of course used up in firing as soon as possible.

164.

FUZE, PERCUSSION. D.A.No.115.E.

The re-introduction of the above mentioned fuze has been approved for use with Q.F. 18 pr. H.E. and Bursting Smoke streamline projectiles. The design of this fuze is similar to that of the fuze No.106.E but differs in external shape. The design will be brought up to date to incorporate all improvements approved for the No.106.E fuze which are also applicable to No.115.E fuze.

165.

MARKING OF AMMUNITION 20 M.M. HISPANO GUN H.E.

Reference Item 87, Bulletin No.9. The use of the code letter "R" instead of the letters "H.E." for the identification marking of the H.E. cartridge has been approved.

Magnetic Mines used as bombs.Fig.42

The German Air Force has been dropping magnetic mines in Coastal waters since November 1939. In the early stages these mines were usually dropped by sea-planes of the 115 type from a height of 900-ft. or less. Later it was found that bombers were being employed for this work and it is known that the Heinkel III carries two mines of the sea type which together weigh about 4,300-lbs.

Up to the present four types, classed as A, B, C and D by the Admiralty, have been identified, but only the latter two types appear to be in use now.

The first intentional use of magnetic mines against land targets commenced on the night of September 16th, 1940, when numbers of both C and D types were dropped in night raids.

The C and D types are cylindrical in shape, with a hemispherical leading end and a casing forming a cone shaped tail within which the parachute is housed.

On release of the mine from the aircraft the cone is torn free by wire attached to the fuselage and, acting as a pilot parachute, causes the main parachute to open within five seconds.

The length of the parachute for Type "A" is about 17-ft. diameter 15-ft.

The mine is fitted with a magnetic device (for use under water) and also a bomb fuze. It is the latter, operated by a clockwork fuze, that causes detonation when the mine is used against land targets. The fuze is so arranged that it is started by impact of the bomb on the ground but a safety device prevents the jerk caused by the opening of the parachute starting the mechanism. The bomb is timed to detonate 25 seconds after the clockwork fuze has been put into operation. Cases have been known when the mechanism has stopped before the lapse of the full 25 seconds, and has been restarted later by vibration or disturbance.

When used at sea the time device does not operate; a diaphragm is provided which arrests the clockwork under any pressure equivalent to 7-feet of water or more.

The case of these mines is thin and will not stand the impact caused by dropping from any height without a parachute attachment. It has consequently been suggested that one means of combating these mines after spotting in the air, is to shoot at them either with a view to exploding them in the air or destroying the parachute. It is pointed out, however, that no attempt should be made to fire at these mines at a height of less than 1,500 ft., since if detonated much below this height the effect might well be worse than if detonated on the ground.

The fact that they do not penetrate at all on landing results in the blast being more horizontal in effect than with an ordinary bomb which, even with a fractional delay, will penetrate a certain distance before detonation. There is a marked difference in the effect of these mines against badly constructed or old buildings as compared with strongly made modern structures. In the case of small poorly constructed houses there is a considerable area of devastation, but well made barracks and concrete structures are not destroyed and generally have only windows and doors blown in. The mine is not particularly effective as an anti-personnel weapon when compared with the weight of explosive carried.

Another effect of the mines alighting on the surface of the ground without penetrating is that unexploded mines are considerably easier to deal with than ordinary blind bombs which require locating and excavating.

Having regard to the complicated nature of the mine, its use against land targets cannot be considered economical, and consequently the use by the G.A.F. of these mines is probably due to the fact that they were readily available as an article of store, and a certain quantity were surplus to naval requirements. This again might indicate that they were less effective at sea than they had hoped.

167. ANTI-PERSONNEL BOMB - NEW TYPE.

A new type of small anti-personnel bomb has been reported to have been used by enemy aircraft. The bomb itself is housed in an outer cylindrical case, the dimensions of which are $3\frac{1}{2}$ inches long by $3\frac{1}{4}$ inches in diameter. This outer casing is coloured dark grey-green of the usual German Field service colour and is ribbed. The bomb itself is of black lead grey colour.

When dropped the case opens into two halves under the action of powerful springs. The case remains attached to the bomb by a length of wire approximately 5 inches long. When falling in this position the opened case is presumably intended to retard the fall of the bomb.

The weight of the bomb is 4 lbs. the charge being yellow T.N.T. The bomb casing is $\frac{3}{8}$ inch thick and the danger area due to fragmentation is within a radius of 50 feet.

Some of these bombs explode on striking the ground, others however remain unexploded but are liable to explode when handled. The chief danger of the bomb arises from the handling of these unexploded bombs.

The bombs appear to have been dropped from a low altitude, many bombs being sprinkled indiscriminately over a few areas. The use of the bomb can be recognised from the number of hinged outer cases of the distinguishing dark green colour, scattered on the ground in the neighbourhood of the attack.

168. INCENDIARY BOMBS - COLLAPSIBLE CONTAINER.

Incendiary bombs dropped from German aircraft are frequently released in a container which opens in the air and scatters 36 of the ordinary 1 Kg. incendiary bombs. (Item 141 Ammunition Bulletin No.13).

The container has three side pieces measuring 43 inches in length with a separate end piece about 9 inches square and a similar piece hinged to it. The side pieces are of aluminium and the end pieces are of a light strong alloy. The whole is normally painted the standard German grey-green. A central rod which fits the container is about 42 inches long with an eye at one end and usually with felt pads attached to it. This rod is painted aluminium colour and is often picked up separate.

The device which has frequently but erroneously been referred to as a Molotoff Bread Basket is opened in the air by means of a small mechanically operated delay action contact maker operating an electro-magnetic opening device. The portion of the container carrying the opening mechanism has the following German description :-

Achtung (Beware)
Verzögerungswerk (retarding mechanism)
Aufziehen (pull)

The whole container is released from the aircraft with its load and falls for about five seconds before its collapse is effected by the clockwork mechanism set in motion at the moment of release from the aircraft. The bombs are scattered and the container is usually found in pieces on the ground.

It has been recorded on several occasions that an air flash has been observed 100-ft. or so above the ground followed by a loud report and the scattering of incendiary bombs. This would seem to point to a small explosive charge being used to open the container, but this cannot yet be definitely established.

The object of using the container may be to achieve a closer concentration than can be effected with a load of these bombs released separately from the aircraft at high altitudes. If the target is of comparatively small dimensions the spread by the latter method may be such that only a few bombs actually reach the objective and experience shows that a small number can be promptly dealt with by the Civil Defence organisation. The close pattern that can be achieved by means of the container is shewn by the fact that 30 incendiary bombs were found in one small works covering an area of not more than 150-ft. x 200-ft. In another area about 200-ft. x 300-ft, 25 fires were started.

169

INCENDIARY BOMB. 1 KG. (GERMAN)

With reference to Item 141, Bulletin No.13, the above bomb may have a small explosive charge in it with a delay from 1 to 1½ minutes. The explosive charge is in a small black container, 1 inch in diameter and 1 inch long, screwed into the tail end of the bomb body. Blankets of four thicknesses are effective at NOT less than 20 feet. Unscreened fragments penetrate 2 inches of wood or 3/16 inch of mild steel plate at 15 feet. The method of dealing with this bomb will depend upon the circumstances. A Bomb in the open should be left to burn out unless it is necessary to deny the enemy the use of the illumination or to prevent further serious conflagration in which case a filled sand bag or other suitable material could be placed over the bomb provided this action is taken immediately. Otherwise a water jet directed from a position under cover is recommended. It is improbable that a bomb falling within a building could be dealt with immediately and in this case a period should be allowed to elapse before approaching the bomb. The Home Office recommend a period of 2 minutes.

170

AMENDMENTS - MARKINGS ON GERMAN GAS BOMBS.

Reference Bulletin No.5, Para.45. To conform with the normal descriptive method of referring to chemical fillings delete the details under the sub heading "Gas Bombs" and substitute:-

White Cross	indicating	Tear Gas.
Blue Cross	"	Nose Gas.
Green Cross	"	Choking Gas.
Yellow Cross	"	Blister Gas.

No. 171. GERMAN AIRCRAFT BOMBS.Method of determining whether bombs dropped from high altitude have exploded.

The following notes have been compiled from an examination of bomb craters and are published to assist in determining whether bombs have detonated or not. Fig. 41, A, B, C, D, and E illustrate typical examples of craters which may be expected after a high altitude attack; this drawing is not to scale and the depth of penetration of the bombs will vary with the height of the attack and the nature of the soil.

"A" Bomb not detonated.

This illustrates a typical effect of a bomb penetrating the ground and not detonating. The hole is clean cut and the bomb generally has come to rest at an angle from its original path. Bomb holes of this type should be treated as dangerous as the bomb may be fuzed for delay action. An apparatus is now available which will, if lowered into the hole, indicate whether the bomb has detonated or not.

"B" Bomb detonated.

This illustrates the same type of hole as in "A" except that the bomb has turned from its original path and detonated. Generally, there is no indication on the surface that the bomb has detonated. Bombs of this type, however, can usually be easily identified by the very pronounced blackening on the sides of the hole. These bombs, on detonation, when viewed from a distance, often emit a very large flame and quantities of black smoke, from the crater; they may quite easily be mistaken for incendiary bombs.

"C" Bomb detonated.

This illustrates a bomb which has detonated below the surface and only just raised the level of the ground in the immediate vicinity of the hole.

"D" Bomb detonated.

This illustrates a bomb which has detonated too far below the surface to cause a crater and has had just sufficient power to raise the earth.

"E" Bomb detonated.

This illustrates a typical crater when the bomb has detonated on impact or after a very short delay.

Note 1. While digging up apparently unexploded bombs, care should be taken to see that the bomb has not in fact exploded and formed a large cavity under the surface as there is a risk of the earth collapsing and precipitating personnel into the cavity, possibly with serious results owing to the presence of carbon monoxide or other toxic gases. The diameter of the subterranean cavities (known as camouflet) may be of the order of 20-ft. radius in the case of large bombs such as 1,000-lb. bombs.

Note 2. When filling in bomb holes in roads &c. care must be taken to ascertain whether the camouflet is so near the surface that the latter might subside should any weight be placed on it. A heavy roller should, therefore, be passed over the surface in the vicinity of the bomb hole before the latter is filled in.

172.	ALL FIGURES GIVEN ON THIS CHART ARE APPROXIMATE, THE RESULTS BEING OBTAINED FROM A SMALL NUMBER OF SAMPLES.						GERMAN SMALL						
	1	2	3	4	5	6	7	8	9	10	11	12	13
	CALIBRE IN M/M	TYPE	COLOUR OF CAP ANNULUS	COLOUR & RECOGNITION MARKINGS OF PROJECTILE	GERMAN NOMEN.	BRITISH NOMEN TYPE.	PROJECTILE.						
							WEIGHT	ENVELOPE OR SHELL MATERIAL	CORE WEIGHT OF A.P.	CORE SHOT HARDNESS FROM BASE	SLEEVE.	FILLING & WEIGHT	FUZE.
A.	7.92	MAUSER STREAMLINE	GREEN	GILDING METAL	6S	BALL	198 GRNS. 12.85 GRM	STEEL COATED GILDING METAL (BOTH SIDES.)	LEAD				
B.	7.92	MAUSER STREAMLINE	RED TRANSLUCENT LACQUER	GILDING METAL	SMK	A.P.	178 GRNS. 11.5 GRM.		STEEL 89 GRNS. 5.76 GRM.	883 890	LEAD FULL LENGTH.		
C.	7.92	MAUSER STREAMLINE	RED TRANSLUCENT LACQUER.	GILDING METAL BLACK TIP (10 M/M)	SMK L' SPUR.	A.P.T.	157 GRNS. 10.18 GRM		STEEL 39 GRNS. 2.53 GRM.	890 915	LEAD FULL LENGTH		
D.	7.92	MAUSER STREAMLINE	RED ENAMEL ON CAP, IN ANNULUS OR BAND ACROSS BASE (SOMETIMES BLACK ANNULUS	GILDING METAL		A.P.I.	157 GRNS. 10.1 GRM.		STEEL 38 GRNS. 2.47 GRM.	905 862		YELLOW PHOSPHORUS ROUND STEM OF A.P. CORE 5 GRNS.	
E.	7.92	MAUSER PARALLEL	RED ENAMEL ON CAP.	GILDING METAL		A.P.	194 GRNS. 12.6 GRM.	STEEL COATED GILDING METAL (BOTH SIDES.)	TUNGSTEN CARB. 127 GRNS. 8.25 GRM.	1859 1817 1463 1625	LEAD FULL LENGTH		
F.	7.92	MAUSER STREAMLINE	BLACK.	GILDING METAL CHROMIUM PLATED TIP.	B-PATRONE	INCENDIARY OBSERVING.	167 GRNS. 10.8 GRM.				LEAD SKIRTED PLUG.	PHOSPHORUS IN TIP.	PERCUSSION DETONATOR STRIKER & SPLIT SLEEVE IN TUBE.
G.	7.92	MAUSER STREAMLINE	BLACK.	BLACK PLAIN GILDING METAL TIP.		INCENDIARY OBSERVING.	167 GRNS. 10.8 GRM.				LEAD SKIRTED PLUG.	PHOSPHORUS IN TIP.	PERCUSSION DETONATOR STRIKER & SLEEVE.
H.	7.92	MAUSER	RED ON CAP.	BLACK.	SMK (H)	A.P.I.							
I.	20	OERLIKON	BLACK	YELLOW BLACK BAND ABOVE DRIVING BAND FUZE BRASS (A.Z. 1501.)		S.D.T. SHELL	2080 GRNS. 135 GRM.	STEEL.				PENTHRITE WAX. 57.1 GRNS. 3.7 GRM.	D.A. BRASS BODY & CAP. AUXILIARY DETONATOR G.P. (GAINIE) & CAP & CENTRIFUGAL SEGMENT HELD BY WATCH SPRING.
J.	20	OERLIKON	BLACK	YELLOW FUZE BRASS (A.Z. 1501)		S.D.T. SHELL.	2070 GRNS. 134 GRM.	STEEL.				PENTHRITE WAX.	
K.	20	OERLIKON	BLACK	STEEL WHITE BAND ABOVE DRIVING BAND, FUZE BRASS.		S.D.T. SHELL.	2080 GRNS. 135 GRM.	STEEL				PENTHRITE WAX. 49.2 GRNS 3.2 GRM	
L.	20	OERLIKON	BLACK	OLIVE GREEN		BALL SHOT.	2053 GRNS. 133 GRM	STEEL					

ARMS AMMUNITION.

14	15	16	17	18	19	20	21	22	23	24	25	26
CASE	CAP	BALLISTICS.			TRACE COLOUR & LENGTH.	GUNS IN WHICH USED.	SERVICE IN WHICH USED.	FURTHER DETAILS FROM	GENERAL SKETCH OF PROJECTILE	EFFECT ON TARGET.	REMARKS.	
		O.V. 90 FT.	CHARGE WEIGHT & PROPELLANT TYPE.	PRESSURE								
BRASS OR STEEL	BRASS 3.85 GRNS. .25 GRM.	2510	N.C. FLAKE 44-45 GRNS. 2.9 GRM.	17-18 TONS @ 80° F		MAUSER RIFLE RHEIN METAL SOLOTHURN MAGAZINE & BELT FED	AIR LAND.	O.B. PROCEDURE 3240		ENERGY AT 90 FT. 2785 FT/LBS	A.	
BRASS OR STEEL		2620		18-19 TONS @ 80° F		RHEIN METAL SOLOTHURN MAGAZINE & BELT FED.	AIR.	O.B. PROCEDURE 3240 8227.		ABOUT 11 ^M / _M AT NORMAL AT 100 YDS. ENERGY AT 90 FT. 2727 FT/LBS	STEEL CASE MARKED VIII W.I. YEAR 39 B.	
BRASS		2720		16-17 TONS @ 80° F	GREEN CHANGING TO RED OR ALL YELLOW OR ALL GREEN CHANGE AT 400-500 YDS. 900-1000 YDS		AIR.	O.B. PROCEDURE 3240 8410		ENERGY AT 90 FT. 2593 FT/LBS	SOMETIMES COPPER PLATED CAP. C.	
BRASS		2740		16-17 TONS @ 80° F	WHITE SMOKE 400-500 YDS		AIR.	O.B. PROCEDURE 3240 7677		ABOUT 8 ^M / _M AT NORMAL AT 100 YDS. ENERGY AT 90 FT. 2631 FT/LBS.	D.	
BRASS				N.C.T. 55.7 GRNS. 3.6 GRM.					O.B. PROCEDURE 6090	SEE PAGE 7: Z	E.	
BRASS		2670	N.C. FLAKE 44-45 GRNS. 2.9 GRM.	17-18 TONS @ 80° F			AIR.	O.B. PROCEDURE 6329. 6846.		ENERGY AT 90 FT. 2657 FT/LBS	ALLEGED BY GERMANS TO BE FOR TRAINING & BALLISTIC EXPERIMENTS ONLY. F.	
BRASS		2660				AIR.		ENERGY AT 90 FT. 2479 FT/LBS.	G.			
										PERFORATION ALLEGED BY GERMANS TO BE 60% BETTER THAN SMK.	H.	
BRASS		BRASS 15.5 GRNS. 1.01 GRM.		N.C. FLAKE 225.5 GRNS. 14.6 GRM.		YELLOW BRIGHT.	OERLIKON.	AIR	O.B. PROCEDURE 5156 6040 7563 8565		FUNCTIONS ON .012 M.S. FAIR FRAGMENTATION.	I.
BRASS			1900			YELLOW BRIGHT	OERLIKON	AIR	O.B. PROCEDURE 8565		J.	
BRASS			N.C. FLAKE.		WHITE BRIGHT	OERLIKON	AIR	O.B. PROCEDURE 8565.		FUNCTIONS ON .012 M.S. POOR FRAGMENTATION.	K.	
BRASS			N.C. FLAKE 225.5 GRNS 14.6 GRM.			OERLIKON.	AIR	O.B. PROCEDURE 8193 8565.		L.		

172. ALL FIGURES GIVEN ON THIS CHART ARE APPROXIMATE, THE RESULTS BEING OBTAINED FROM A SMALL NUMBER OF SAMPLES.

CONTINUED

GERMAN SMALL

	1	2	3	4	5	6	7	8	9	10	11	12	13
	CALIBRE IN M/M	TYPE	COLOUR OF CAP ANNULUS.	COLOUR & RECOGNITION MARKINGS OF PROJECTILE	GERMAN NOMEN.	BRITISH NOMEN TYPE.	PROJECTILE.						
							WEIGHT.	ENVELOPE OR SHELL MATERIAL	CORE WEIGHT OF A.P.	CORE SHOT HARDNESS FROM BASE	SLEEVE.	FILLING & WEIGHT	FUZE
M.	20	OERLIKON	BLACK	OLIVE GREEN MAUVE & YELLOW BANDS ABOVE DRIVING BAND.		TRACER SHOT.	2053 GRNS 133 GRM.	STEEL					
N.	20	OERLIKON	BLACK	OLIVE GREEN YELLOW BAND ABOVE DRIVING BAND, WHITE BAND & ARROWS ON NOSE.		TRACER SHOT.	2094 GRNS 136 GRM.	STEEL					
O.	20	SOLOTHURN	BLACK	BLACK YELLOW BAND ABOVE DRIVING BAND.		A.P.T. SHOT.	2280 GRNS 148 GRM.	STEEL		725 741 836			
P.	20	SOLOTHURN	BLACK	YELLOW FUZE ALUMINIUM (A.Z. 5045)		S.D.T. SHELL	1844 GRNS 120 GRM.	STEEL				PENTHRITE WAX 92.5 GRNS 6.0 GRM.	D.A. ALUMINIUM BODY (HOLDING BRASS GAINES) & CAP & CENTRIFUGAL SEGMENT HEL BY WATCH SPRING
Q.	20	SOLOTHURN				A.P.T. SHELL.	2273 GRNS 147.3 GRM.	STEEL					
R.	9	MAUSER.	BLACK	GILDING METAL OR CUPRO-NICKEL	PIST. PATRONE .08	BALL	123 GRNS. 8 GRM.	STEEL COATED GILDING METAL BOTH SIDES OR CUPRO-NICKEL OR STEEL COATED CUPRO-NICKEL					
S.	20	OERLIKON.		YELLOW BLACK BAND BELOW FUZE, FUZE BRASS (A.Z. 1502.)		SHELL		DRAWN STEEL ROUND BASE				PENTHRITE WAX.	D.A. STRIKER HELD BY SEGMENTS WITH SOFT METAL NTRIFUGAL PE.
T.	20	OERLIKON.		YELLOW FUZE ALUMINIUM (A.Z. 1504.)		S.D.T. SHELL.	1844 GRNS 120 GRM.	STEEL				PENTHRITE WAX.	D.A. ALUMINIUM BODY (HOLDING BRASS GAINES) & CUP BALL STRIKER STRIKER HOLDER CENTRIFUGAL BOLTS & SPRINGS
U.													
V.													
W.													
X.	30	SOLOTHURN		BLACK.		A.P.T. SHELL.	8255 GRNS 535.2 GRM.	STEEL				PENTHRITE WAX.	BASE ALUMINIUM STRIKER HELD BY WASHER WITH LIPS, DETONATOR & RESTRICTED FLASH HOLES
Y.													
Z.	30	SOLOTHURN		YELLOW WHITE BAND ABOVE DRIVING BAND. BLACK BAND ON OGIVE ALUMINIUM FUZE (A.Z. 1504)		TRACER SHELL	4492 GRNS 291.2 GRM.	DRAWN STEEL ALUMINIUM NOSE & BASE				T.N.T. FILLING PENTHRITE WAX PELLET AROUND GAINE.	D.A. AS AT T.13

ARMS AMMUNITION.

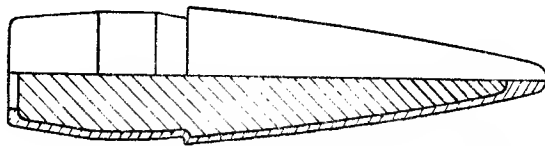
14	15	16	17	18	19	20	21	22	23	24	25	26	
CASE	CAP	BALLISTICS.			TRACE COLOUR & LENGTH	GUNS IN WHICH USED.	SERVICE IN WHICH USED	FURTHER DETAILS FROM.		GENERAL SKETCH OF PROJECTILE	EFFECT ON TARGET.	REMARKS.	
		O.V. 90 FT.	CHARGE WEIGHT & PROPELLANT TYPE	PRESSURE									
BRASS	101 GRM	1900	N.C. FLAKE 225.5 GRNS. 14.6 GRM.		WHITE BRIGHT	OERLIKON	AIR	O.B. PROCEDURE 8193 8565					M.
BRASS	15.5 GRNS	1900				OERLIKON	AIR	O.B. PROCEDURE 8193 8565					N.
BRASS		2750	N.C.T. 572 GRNS 37.4 GRM. BURSTER BLACK POWDER IN SILK BAG. 16.2 GRNS 1.05 GRM			SOLOTHURN HEAVY.	NAVY						O.
BRASS		2750	N.C.T. 633 GRNS. 41 GRM BURSTER BLACK POWDER IN SILK BAG.		WHITE	SOLOTHURN HEAVY.	NAVY			Nº		FELT WASHER BETWEEN FUZE & FILLING. FUZE SAME TYPE AS OERLIKON ONLY IN ALLUMINIUM INSTEAD OF BRASS.	P.
BRASS		2750						O.B. PROCEDURE 8549		PAGE			Q.
BRASS 60 GRNS 9.9 GRM.	BRASS	1038 AT 60 FT.	N.C. FLAKE 36 GRNS 5.6 GRM.			PARABELLUM MAUSER SCHMEISSER M/C	AIR LAND			SEE			R.
		2260				OERLIKON.	AIR						S.
		1900			WHITE BRILLIANT.	OERLIKON.	AIR						T.
													U.
													V.
													W.
DRAWN STEEL	PRIMER BRASS		N.C.T. 1482 GRNS.				AIR	O.B. PROCEDURE 8585					X.
													Y.
DRAWN STEEL	PRIMER BRASS		N.C.T. 1702.6 GRNS		WHITE BRILLIANT.		AIR	O.B. PROCEDURE 8585					Z.

172
CONTINUED

THESE SKETCHES ARE
NOT TO SCALE.

GERMAN SMALL

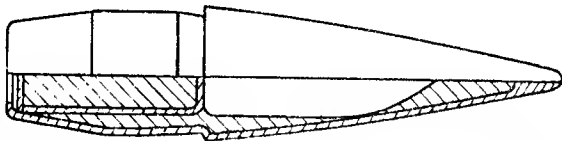
GENERAL SKETCH OF PROJECTILE



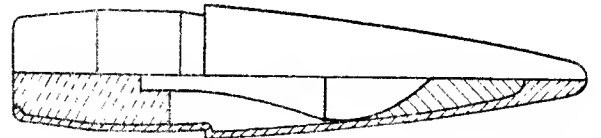
A.24.



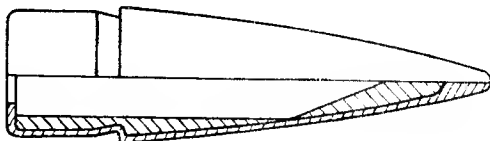
B.24.



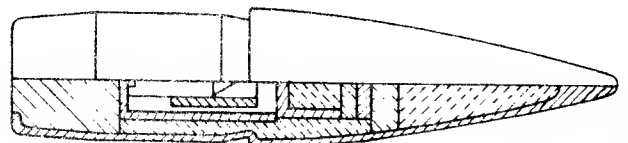
C.24.



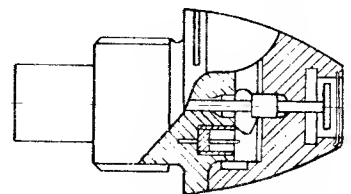
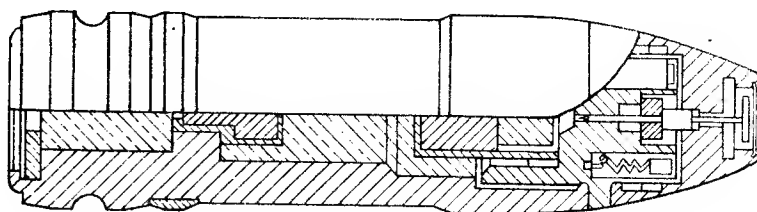
D.24.



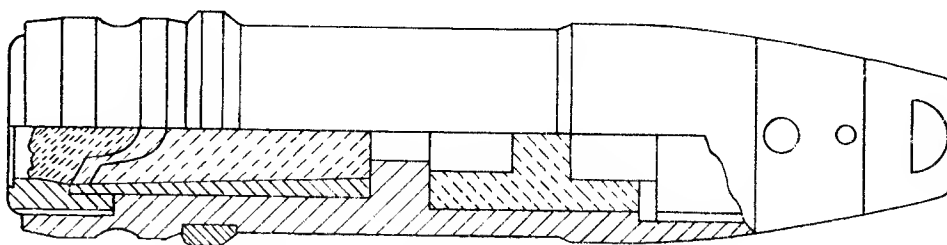
E.24.



F & G.24.

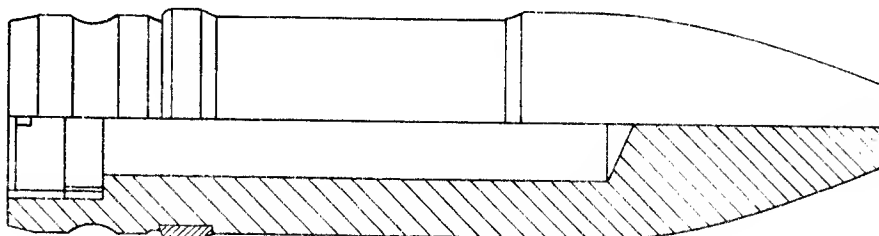


I.24.

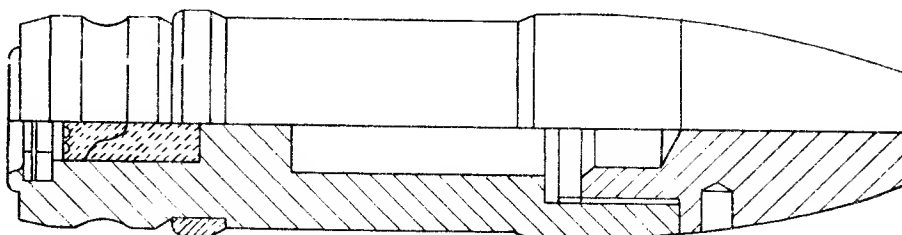


Brass Fuze as at P. 24.

K.24.



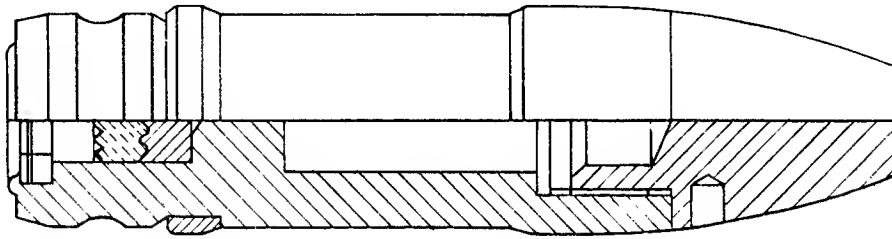
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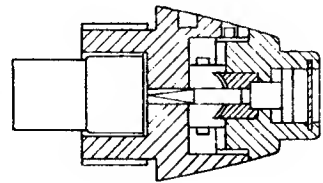
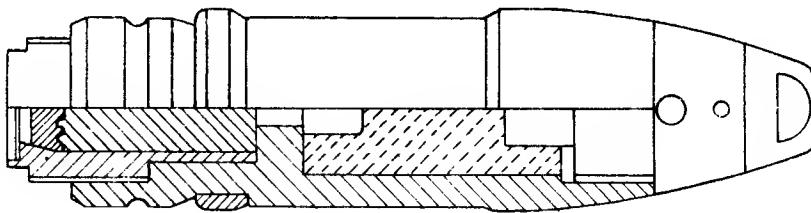
M.24.

ARMS AMMUNITION.

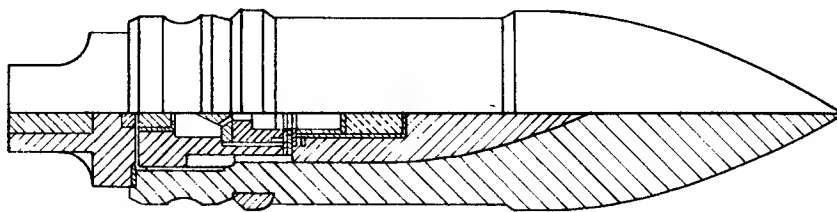
SEE PAGE N°



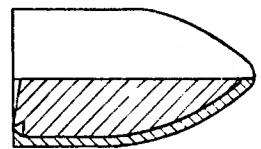
N. 24.



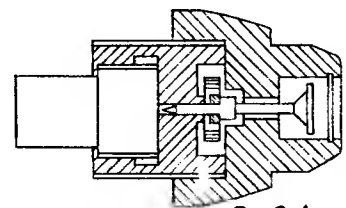
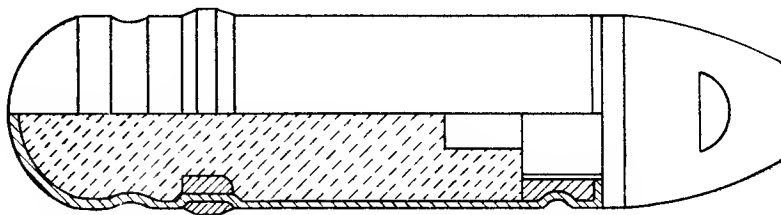
P. 24.



Q. 24.



R. 24.



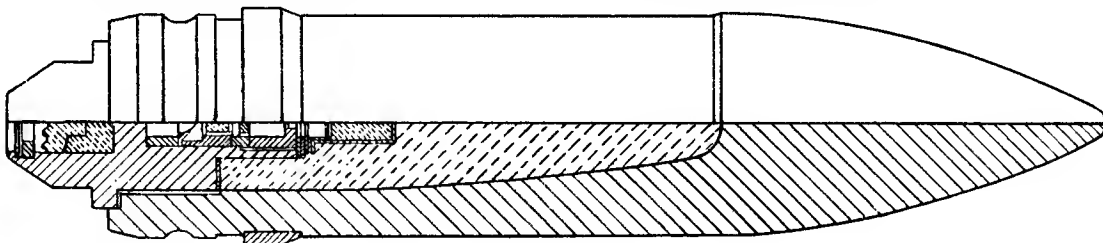
S. 24.

Body as at I. 24.

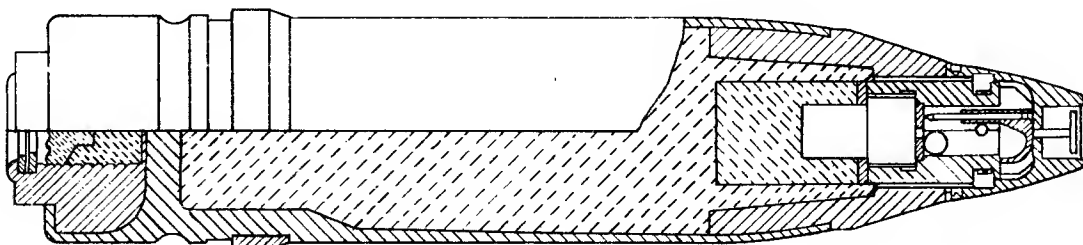
Fuze as at Z. 24.

Firing pin carrier is drilled, apparently to lighten.

T. 24.



X. 24.



Z. 24

173. DETAILS OF ITALIAN AIRCRAFT, BOMBS AND FUZES.

Information available at present is scanty and in some instances contradictory.

1. H.E. BOMBS.

(a) The following details were obtained from an Italian official document:-

Bomb.	Overall length (a) With tail. (b) Bomb body.	Overall diameter (a) Complete bomb. (b) Bomb body.	Total weight.	Weight of filling.	Remarks
	inches.	inches	kg.	kg.	
Bomba da 800 (Model 28) ...	(a) 40 (b) 74.5	(a) 18.0 (b) 18.0	800	357	Probably light eased demolition bombs.
Bomba da 500 (Model 28) ...	(a) 101 (b) 51.6	(a) 18.0 (b) 18.0	500	220	"
Bomba da 250 (Model 28) ...	(a) 79.6 (b) 32.5	(a) 17.8 (b) 17.5	250	120	"
Bomba mina da 100 ... (mine bomb)	(a) 48.5 (b) 31.3	(a) 10.0 (b) 9.95	100	27.5	
Bomba torpedine da 50 ... (torpedo type bomb)	(a) 38.5 (b) 23.8	(a) 10.0 (b) 9.95	50	25	
Bomba mina da 31 ... (mine bomb)	(a) 31.5 (b) 21.4	(a) 7.5 (b) 6.37	31	10.5	
Bomba mina da 15 ... (mine bomb)	(a) 31.1 (b) 21.5	(a) 6.3 (b) 4.72	15	5.6	Possibly anti-personnel bomb.
Bomba da 12 ...	(a) 32.4 (b) 17.1	(a) 3.74 (b) 3.54	12	1.8	"
Bombetta Spezzone da 2 ... ("Spezzone" bomb)	(a) 5.92 (b) 4.53	(a) 2.75 (b) 2.75	2	0.36	Anti-personnel bomb.

- (b) A 4.5 kg. (10-lb.) bomb or hand grenade. - Filled T.N.T. 13½ inches long 3½ inches diameter, painted khaki and black with two brass rings round the nose. Resembles a thermos flask in shape. It is fitted with a very sensitive fuze which becomes operative about 30 seconds after impact and will then be functioned by vibration or disturbance. The vibration of moving vehicles or of aircraft engines running up will suffice. Primarily intended for use on aerodromes. A suggested method of clearance is by means of a heavy cable or chain dragged over aerodrome between two suitably protected motor vehicles. Can also be destroyed by small arms fire from a minimum range of 50 yards or by use of armoured Bren gun carrier.

It is reported that a similar bomb about 20 lb. in weight may be used.

It is now known that these bombs include some painted green in addition to normal khaki colour. Green bombs are reported more sensitive and additional care in handling is necessary.

- (c) The following information has been obtained from recovered bombs and fragments:-

Type of bomb.	Overall length (ins.)	Diameter ins.	Weight kg.(approx.)	Weight of filling kg.
	(a) With tail. (b) Bomb body.			
Light case ...	(a). 36 (b). 23	10	60	--
S.A.P.	(a). 30 (b). 12	10	112	22.5

- (d) The following additional bombs are said to exist :-

1500 kg. "demolition" type.
 15 kg. anti-personnel type.
 3 kg. "Breda" bomb, apparently intended for throwing by hand from aircraft against other aircraft, but also used for anti-personnel purposes.
 100 kg. "spindle shaped" bomb with welded cast steel case.

A French report indicates 500, 270 and 75 kg, thick walled bombs of apparently S.A.P. type and a 160 kg. anti-submarine bomb.

2. INCENDIARY BOMBS.

A 2 kg. "Bombetta incendiaria da 2" is referred to in the official document mentioned in 1(a). This is 12 inches long by $2\frac{3}{4}$ inches diameter.

A 25 kg. bomb has been examined. It was 35 inches long x 6 inches diameter and made in three parts joined together by screws. The body is of magnesium and it appears that the bomb is intended to burn like a large electron bomb. The filling is pressed aluminium powder and oxide of iron. An inertia type fuze with arming device and cap and anvil ignition system is fitted. There are six holes in the bomb body sealed with corks.

Portions of a 43 lb. (20 kg.) bomb have been recovered. This appears to be similar to the 25 kg. bomb.

There has been a report of a 70 kg. bomb, but no details are available.

3. GAS BOMBS.

500 kg. and 21 kg. filled syperite, 40 kg. filled phosgene and 280 kg. filled mustard have been reported.

4. FUZES.

The standard method of fuzing H.E. bombs appears to be of inertia type with needle strikers to pierce small detonators, which in turn function the main detonator and exploder. Fuzing is usually in the tail only, but the 160 kg. anti-submarine bombs appear to have both nose and tail fuzing. Arming vanes are fitted. A feature of the standard fuze is the provision of two strikers and two small detonators, apparently to give a double chance of functioning.

A very sensitive fuze is fitted to the 4.5 kg. bomb. (See para.1(b)).

There are no details available of any long delay fuzes.

GERMAN ANTI-WITHDRAWAL DEVICE ZUS 40. (Fig.39)

This device is attached to the gaine of the German (Rheinmetall) electric fuze in a H.E. bomb and is intended to detonate the bomb after the fuze has been withdrawn more than 0.6 inch. The device could be applied to any German (Rheinmetall) electric fuze fitted with a gaine but is most likely to be used in conjunction with the long delay fuze EI.A.Z.(17).

The Figure below indicates the arrangements of the device before the insertion of the gaine of the fuze. The device consists of a cylindrical body prepared at its inner end to receive a gaine (1) while at its outer end it is fitted with an arrangement of knife edges and springs (2) which permit of it being inserted into the exploder tube of the bomb but prevent extraction. The outer end of the body is bored to receive the gaine of the fuze (3) and houses a perpendicular extension piece of the needle (4). The needle, with spring under compression, (5) is housed in a lateral channel in the body at one end of which is fitted an ignifermo detonator (6) adjacent to which is a flash channel (7) leading to the gaine of the device. The needle is held in the safe position (before the insertion of the gaine of the fuze) by the stem of a detent (8) which engages in a recess on the underside of the needle. The detent is held by the pressure of the needle on its stem and located by a steel ball (9).

Action.

On insertion of the fuze, the gaine of the fuze bearing against the extension piece of the needle, causes the extension piece and the needle to move away from the detonator and further compresses the needle spring. This movement of the needle removes the holding pressure of the needle on the stem of the detent and, with the device inclined, the steel ball rolls clear allowing the detent to drop. The needle is then held off the detonator only by the gaine of the fuze bearing against the extension piece.

On attempting to remove the fuze from the ~~unexploded~~ bomb, the gaine of the fuze releases the extension piece of the needle when the fuze is withdrawn 0.6 inch. The needle is then driven on to the detonator by its spring and the flash produced passes through the adjacent flash channel to the perforated top of the gaine of the device and the bomb is detonated.

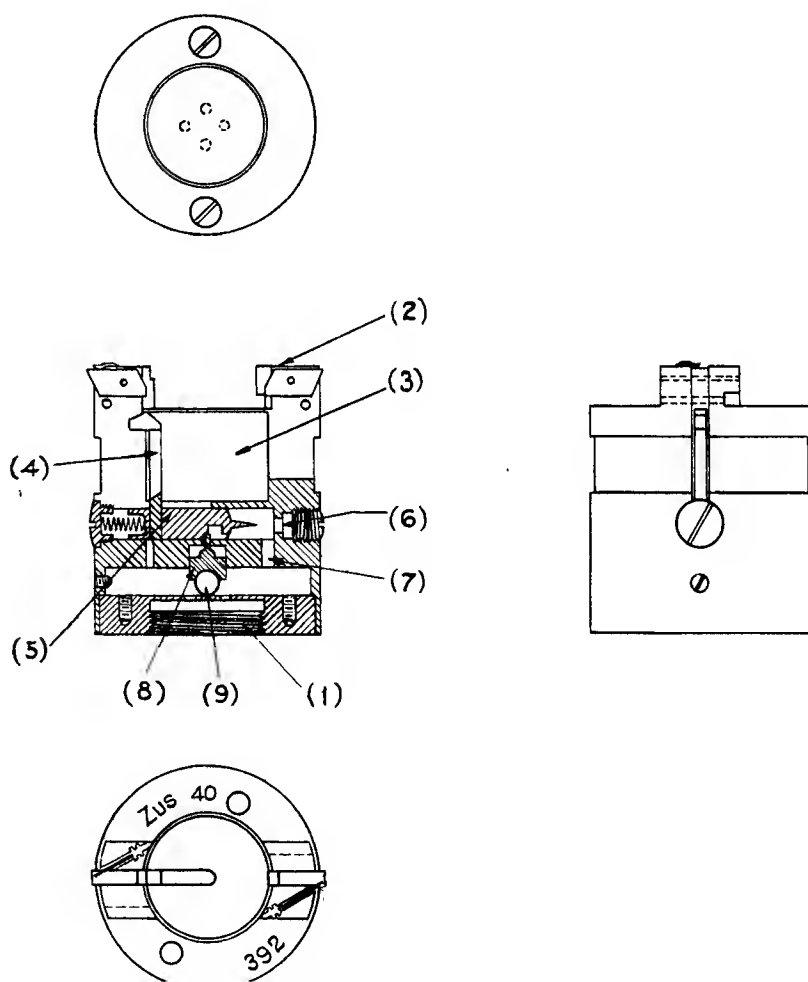
FIG. 39.

FIG. 40.

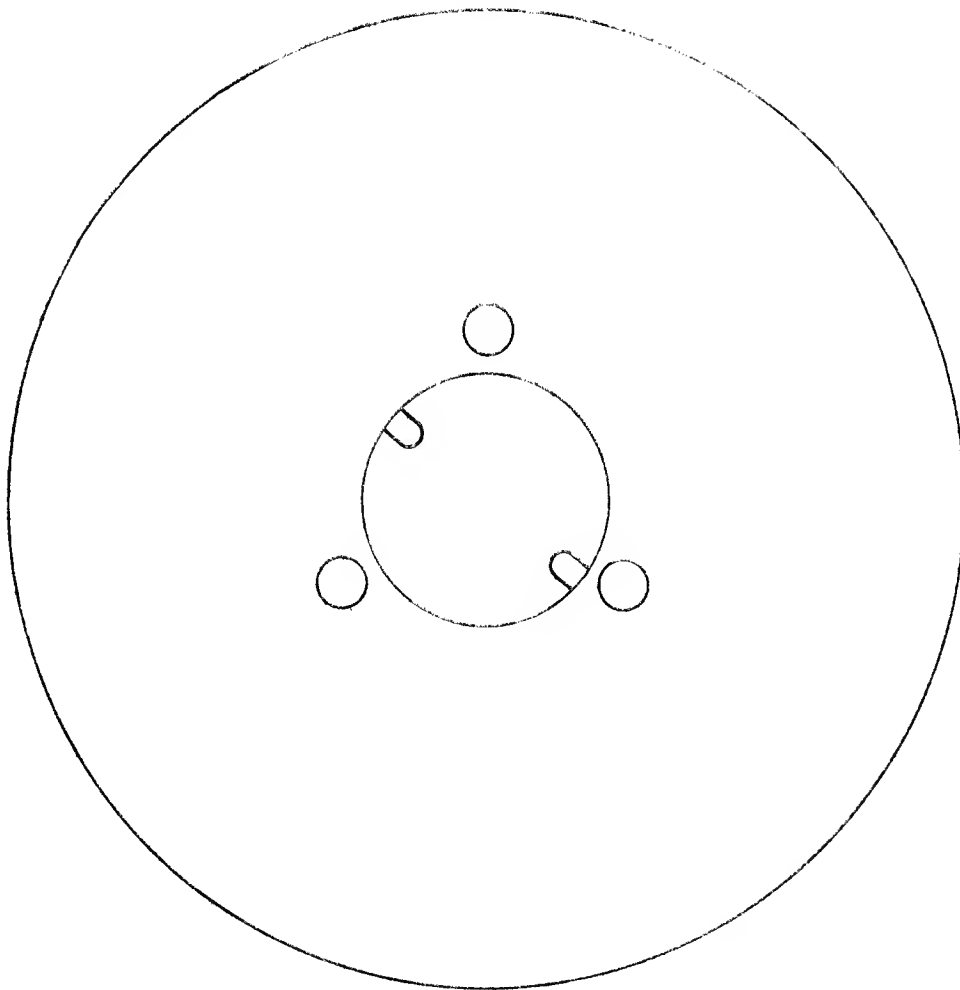


FIG. 41.

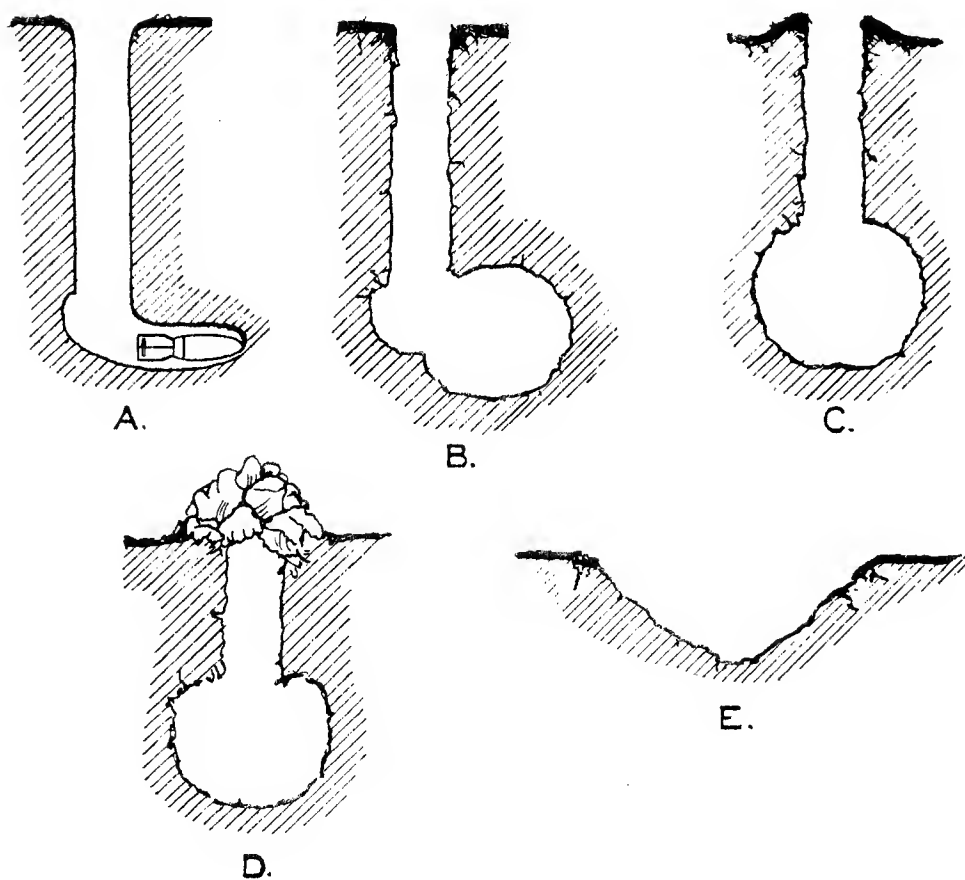
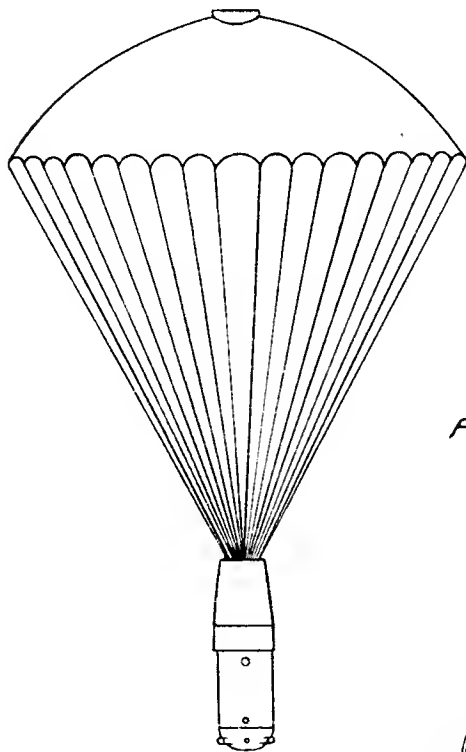


FIG. 42.

TYPE "A" WITH PARACHUTE.



TYPE "A."

Stabilizing legs
6 in N°
equally spaced.

Suspension
hook.

Conical tail in two
halves which fall
away when parachute
is forced out from
interior.

Filling
plug.

Hydrostatic
valve primer.

All-ways fuze.

TYPE "B."

Top stop.

Bomb fuze,
detonator &
primer.

Conical tail
in 3 sections.

Filling plug.

Mine primer, hydrostatic
valve operated.

TYPE "C."

Top stop.

Primer.

Bomb fuze.

Wire for releasing rear
end door.

Tail for housing
parachute.

Rear
end door.

Detonator.

Filling hole.

Filling holes.
Clock & Filling
hole.

Spring plungers
6 in N°
equally spaced.

TYPE "D."

Top stop.

Primer.

Bomb fuze.

Filling
holes.

COMPARISON OF THE 4 TYPES.

TYPE (ADMIRALTY NOMENCLATURE)	LENGTH (OVERALL)	DIAMETER	WEIGHT OF CHARGE (LBS.)	TOTAL WEIGHT. (LBS.)
"A."	8'-0"	2'-1 1/2"	658.	1,128.
"B."	12'-0"	2'-2 1/4"	1,497.	2,107.
"C."	10'-0"	2'-1 1/2"	1,536.	2,176.
"D."	8'-0"	2'-2"	676.	1,173.



